

## Research Seminar Series 2017/18 Hierarchical / Multilevel Models

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**Tuesday, June 5<sup>th</sup> 2018, 15:00**

Lecture room MED 23, Humboldtallee 32

*The use of MCMC methods to estimate discrete time survival / event history models  
with applications in health and veterinary science*

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Abstract:

Discrete time survival /event history models are used to model changes of state that can occur at discrete time intervals and can be estimated via random effect logistic regression models. In this talk, we will be fitting such models using MCMC algorithms and illustrate methodological solutions to two issues that may occur. Firstly, vanilla Metropolis Hastings single site updating algorithms can experience very poor mixing and so we demonstrate how the use of reparameterizations can improve mixing using for illustration examples of continuation / discontinuation of contraceptive use in Indonesia and incidence of mastitis in dairy cattle (Browne et al. 2009). Second, the discrete time approach requires a presence/absence response at each of a set of time points and these may come from an imperfect diagnostic test. We illustrate through the example of bovine tuberculosis in the UK how imperfect test sensitivity can be included in an MCMC algorithm which imputes the true test status.

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This seminar series is financially supported by the Kooperation der SAS-Anwender in Forschung und Entwicklung (KSFE) e.V.